

MICROSTRUCTURE AND MAGNETIZATION OF DOPED Y-Ba-Ca-O MATERIALS PREPARED BY THE MELT QUENCH AND POST ANNEALING METHOD

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Y-Ba-Cu-O bulk materials prepared using the melt quench and post annealing method have been shown to have very high maximum as well as remanent magnetization. Studies have been carried out on materials prepared using this method which deviate from the Y:Ba:Cu = 1:2:3 stoichiometry. In one series of materials, only the stoichiometry was changed, in particular by introducing an excess of yttrium. In other cases, dopants including several rare earths were introduced. Effects of variations in composition on microstructure and phase evolution are discussed, as well as effects on the magnetic susceptibility and on the magnetization. The results show that doped materials can exhibit improvements in magnetic properties. Furthermore, the use of dopants sheds light on the role of defect sites in flux pinning.